

CLAIMS

What is claimed is:

1 1. A system for treatment of infectious waste, comprising in combination:
2 an impactor having a plurality of impact surfaces, adapted to pulverize the
3 infectious waste by impact;
4 a pressurizable mixing drum having an interior adapted to mix pulverized waste
5 with treatment fluid and to hold the pulverized waste and treatment fluid at a
6 superatmospheric pressure, the mixing drum having an inlet end configured for receiving
7 the pulverized waste, said inlet end also configured for discharging the pulverized waste
8 after treatment.

1 2. The system for treatment of infectious waste of claim 1, wherein the
2 treatment fluid comprises Sodium Hypochlorite.

1 3. The system for treatment of infectious waste of claim 1, wherein the
2 impactor further comprises:
3 a housing enclosing an interior chamber, said housing defining an inlet through
4 which infectious waste is received and an outlet through which treated waste is
5 discharged to the mixing drum;
6 a rotor rotatably disposed in the housing, said rotor further comprising an impact
7 surface adapted to impart energy to solid waste constituents by impact therewith, said
8 impact acting to break up solid waste constituents, whereby size reduction is effected; and

9 a target plate comprising an impact surface carried by said housing within the
10 interior chamber adapted to receive impacts from solid waste constituent solids whereby
11 size reduction is effected.

1 4. The system for treatment of infectious waste of claim 1, wherein said
2 presurizable mixing drum is rotatable about an axis of rotation of said drum.

1 5. The system of claim 1, further comprising:
2 air pump means for drawing air through the impactor and into the mixing drum,
3 whereby airborne matter from waste fed into the impactor is drawn into the system,
4 reducing contamination of air surrounding the system, and for applying a surcharge of air
5 to the mixing drum to create a condition of superatmospheric pressure therein, whereby
6 improved absorption of treatment fluid by the pulverized waste and pathogenic organisms
7 contained therein is enabled.

1 6. The system of claim 5, wherein the air pump means comprises:
2 an air pump for drawing air through the impactor and into the mixing drum; and
3 a compressor configured to apply a surcharge of air to the mixing drum.

1 7. The system of claim 6, further comprising:

2 an impactor outlet conduit connecting an outlet of the impactor to the inlet of the
3 mixing drum, said impactor conduit having a valve configured to selectively seal off the
4 impactor from the mixing drum;

5 a compressor conduit connected to the inlet of the mixing drum, and having a
6 valve configured to selectively seal off the compressor from the mixing drum, whereby
7 said mixing drum is selectively pressurizable; and

8 an air pump conduit connected to the inlet of the mixing drum, and having a valve
9 configured to selectively seal off the air pump from the mixing drum.

1 8. The system of claim 7, wherein the mixing drum further comprises spirally
2 oriented mixing flights disposed in its interior, whereby waste and treatment fluid are
3 drawn away from the inlet end and mixed when the mixing drum is rotated in a first
4 direction, and waste and treatment fluid are impelled toward the inlet end when the
5 mixing drum is rotated in a second direction.

1 9. The system of claim 8, further comprising a discharge valve disposed
2 adjacent the inlet end of the mixing drum, whereby the mixing drum may be sealed from
3 the outside environment when said discharge valve is closed, and whereby treated waste
4 and treatment fluid may pass through the discharge valve for disposal when the discharge
5 valve is open.

1 10. The system of claim 8, further comprising a rotatable inlet bearing
2 disposed at the inlet end of the drum, said inlet bearing having a first open position
3 wherein rotation of the drum is permitted, and a second closed position wherein rotation
4 of the drum is substantially prevented and the inlet bearing provides an air-tight seal.

1 11. The system of claim 8, wherein said system further comprises a mobile
2 frame on which the system is carried.

1 12. The system for treatment of infectious waste of claim 1, further
2 comprising a filter in fluid communication with the air pump at an outlet thereof, said
3 filter being adapted to filter out airborne contaminants derived from the infectious waste.

1 13. A system for treatment of infectious waste, comprising:
2 an impactor having a plurality of impact surfaces, configured to break solid waste
3 constituents into smaller size pieces;
4 a rotatable pressurizable mixing drum, having an interior mixing chamber
5 configured for mixing said waste with treatment fluid, and having an inlet end configured
6 for receiving the pulverized waste, said inlet end also configured for discharging the
7 pulverized waste after treatment;
8 means for drawing air through the impactor and into the mixing drum, whereby
9 airborne matter from waste fed into the impactor is drawn into the system, reducing
10 contamination of air surrounding the system, and for applying a surcharge of air to the

11 mixing drum to create a condition of superatmospheric pressure therein, whereby
12 improved absorption of treatment fluid by the pulverized waste and pathogenic organisms
13 contained therein is enabled; and
14 means for sealing the pressurizable mixing drum, whereby waste and treatment
15 fluid can be held within the drum at an elevated pressure.

1 14. The system of claim 13, wherein the means for sealing the pressurizable
2 mixing drum comprises a rotatable inlet bearing disposed at the inlet end of the drum,
3 said inlet bearing having a first open position wherein rotation of the drum is permitted,
4 and a second closed position wherein rotation of the drum is substantially prevented and
5 the inlet bearing provides an air-tight seal.

1 15. The system of claim 14, wherein the inlet bearing further comprises:
2 a cylindrical drum head flange;
3 a cylindrical seal ring coaxially aligned with the drum head flange;
4 a cylindrical weld race disposed between and coaxially aligned with the drum
5 head flange and the seal ring, the weld race being fixedly attached to the inlet end of the
6 drum;
7 a bearing ring disposed between the weld race and the drum head flange, the
8 bearing ring being fixedly attached to the weld race and slidingly disposed against an
9 inner surface of the drum head flange, whereby the inlet end of the drum is supported on
10 said bearing ring while rotating;

11 a plurality of actuators connected to the seal ring and the drum head flange, said
12 actuators configured for selectively drawing the seal ring toward the drum head flange, so
13 as to draw the weld race into close mating contact with the drum head flange to seal the
14 interior of the drum.

1 16. The system of claim 15, further comprising at least one gasket disposed
2 between the drum head flange and the seal ring.

1 17. The system of claim 16, wherein the bearing ring comprises a ring of ultra
2 high molecular weight polymer material, and said bearing ring is affixed to two surfaces
3 of the weld race and disposed in mating alignment with two surfaces of the drum head
4 flange.

1 18. The system of claim 17, wherein the pressurizable mixing drum further
2 comprises spirally oriented mixing flights disposed therein, whereby waste and treatment
3 fluid are drawn away from the inlet end and mixed when the mixing drum is rotated in a
4 first direction, and are directed toward the inlet end when the mixing drum is rotated in a
5 second direction.

1 19. The system of claim 13, further comprising a discharge valve disposed
2 adjacent the inlet end of the mixing drum, whereby treated waste and treatment fluid

which are discharged through the inlet end may pass through the discharge valve for disposal when the discharge valve is open.

20. A system for treatment of infectious waste, comprising in combination:
a multi-stage impactor having a plurality of impact surfaces configured to break solid waste constituents into smaller size pieces, said impactor further comprising:
a housing enclosing an interior chamber, said housing defining an inlet for receiving infectious waste and an outlet for discharging treated waste;
a rotor rotatably disposed in the housing, said rotor further comprising an impact surface adapted to impart energy to solid waste constituents by impact therewith whereby size reduction is effected;
a target plate comprising an impact surface adapted to receive impacts from solid waste constituent solids whereby size reduction is effected;
a pressurizable mixing drum having an interior mixing chamber and an inlet end, said pressurizable mixing drum configured for receiving treatment fluid and waste through the inlet end from the impactor, and for mixing said waste and said treatment fluid, said pressurizable mixing drum being rotatably mounted so as to rotate about an axis of rotation, and having a rotatable inlet bearing disposed at the inlet end of the drum, said inlet bearing having a first open position wherein rotation of the drum is permitted, and a second closed position wherein rotation of the drum is substantially prevented and the inlet bearing provides an air-tight seal, said mixing drum further having spirally oriented mixing flights disposed within said mixing chamber, whereby waste and

20 treatment fluid are drawn away from the inlet and mixed when the mixing drum is rotated
21 in a first direction, and are directed toward the inlet end when the mixing drum is rotated
22 in a second direction;

23 an air pump adapted to draw air through the impactor and into the mixing drum,
24 whereby airborne matter from waste fed into the impactor is drawn into the system,
25 reducing contamination of air surrounding the system;

26 a compressor configured to apply a surcharge of air to the mixing drum to create a
27 condition of superatmospheric pressure therein, whereby improved absorption of
28 treatment fluid by the pulverized waste and pathogenic organisms contained therein is
29 enabled; and

30 a discharge valve disposed adjacent the inlet end of the mixing drum, whereby
31 treated waste and treatment fluid which are discharged through the inlet end may pass
32 through the discharge valve and out of the system for disposal when the discharge valve
33 is open.